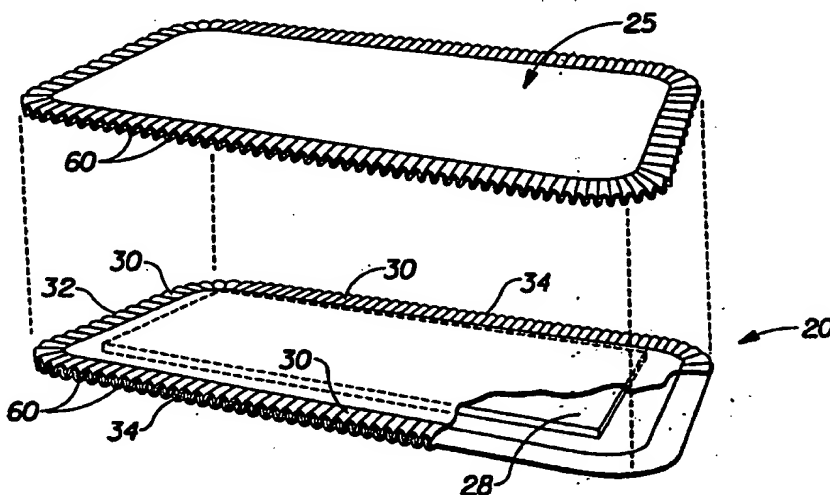




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>A61F 13/15</b>	<b>A1</b>	(11) International Publication Number: <b>WO 98/42286</b> (43) International Publication Date: <b>1 October 1998 (01.10.98)</b>
<p>(21) International Application Number: <b>PCT/IB98/00360</b></p> <p>(22) International Filing Date: <b>16 March 1998 (16.03.98)</b></p> <p>(30) Priority Data: <b>08/823,924</b>      <b>25 March 1997 (25.03.97)</b>      <b>US</b></p> <p>(71) Applicant: <b>THE PROCTER &amp; GAMBLE COMPANY</b> [US/US]; One Procter &amp; Gamble Plaza, Cincinnati, OH 45202 (US).</p> <p>(72) Inventor: <b>HANSER, Thomas, Robert</b>; 769 Lakewood Drive, Taylor Mill, KY 41015 (US).</p> <p>(74) Agents: <b>REED, T., David et al.</b>; The Procter &amp; Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45217 (US).</p>	<p>(81) Designated States: <b>AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</b></p> <p><b>Published</b> <i>With international search report.</i></p>	

(54) Title: **ABSORBENT ARTICLE HAVING A PROTECTIVE, RELEASABLE COVER ON THE TOPSHEET UPPER SURFACE**

## (57) Abstract

The present invention provides an absorbent article having a liquid impervious backsheet and a liquid pervious topsheet joined to the backsheet. The topsheet has a bottom surface positioned away from a wearer and an upper surface oriented toward the skin of the wearer when the absorbent article is being worn. An absorbent core is positioned between the topsheet and the backsheet, and a protective cover is releasably attached to the topsheet upper surface such that the protective cover at least partially covers the topsheet upper surface, thereby protecting the topsheet upper surface from exposure and contamination prior to its use.

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

5                    **ABSORBENT ARTICLE HAVING A PROTECTIVE,  
RELEASABLE COVER ON THE TOPSHEET UPPER SURFACE**

**FIELD OF THE INVENTION**

10            The present invention provides an absorbent article having a protective, releasable cover on the topsheet upper or user surface for protecting the article from exposure and contaminants prior to its use.

**BACKGROUND OF THE INVENTION**

15            Manufacturers provide absorbent articles which are expected to be clean and free of contaminants by users. Manufacturers have done this by first providing sanitary materials, e.g., topsheets and backsheets, and then protecting these materials through packaging, i.e., completely or nearly completely covering the absorbent articles.

20            For example, U.S. Patent No. 5,295,988 issued to Muckenfuhs, et al. on March 22, 1994 and U.S. Patent No. 4,556,146 issued to Swanson, et al. on December 3, 1985 disclose absorbent articles which are individually packaged and folded. This packaging configuration has worked well to protect the topsheets of the articles therein.

25            Additionally, U.S. Patent No. 5,330,461 issued to Leeker on July 19, 1994 and U.S. Patent No. 5,281,209 issued to Muckenfuhs, et al. on March 22, 1994 teach partially protecting a sanitary napkin by folding side flaps over onto the topsheet upper surface of the napkin. However, this folding over has worked only to partially protect the topsheet, while leaving other parts of the topsheet upper surface unprotected prior to its use.

30            In many cases, an absorbent article such as a sanitary napkin may be removed from its package long before its use. In this state, the napkin loses the protective benefits that the individual package provides. A need thus arises to keep the topsheet clean and free of contaminants while it resides outside of its package. One can easily imagine a situation where an unprotected, unpackaged diaper resides adjacent to bottles, food, soiled garments, etc. in a diaper bag or a unpackaged  
35            sanitary napkin sits adjacent to cosmetics, gloves, keys, etc. in a female's purse.

Therefore, it is an object of the invention herein to provide a protective, releasable cover on the topsheet upper surface of an absorbent article.

It is a further object herein to provide a protective, releasable cover that can either substantially or fully cover the topsheet upper surface as required.

5 It is an additional object herein to provide alternative embodiments that can comprise additional substances like lotion, perfume, medicine, etc. between the topsheet upper surface and the protective, releasable cover.

It is a further object herein to provide a protective, releasable cover herein that can move dynamically with the absorbent article herein prior to its use without  
10 substantial bunching or gapping.

### SUMMARY OF THE INVENTION

Accordingly, the present invention provides an absorbent article comprising a liquid impervious backsheet and a liquid pervious topsheet joined to the backsheet.  
15 The topsheet has a bottom surface positioned away from a wearer and an upper or user surface oriented toward the skin of the wearer when the absorbent article is worn. Furthermore, an absorbent core is positioned between the topsheet and the backsheet, and a protective cover is releasably attached to the topsheet upper surface such that the protective cover at least partially covers the topsheet upper surface.  
20 The protective cover comprises a pair of opposed end edges and a pair of opposed longitudinal edges. In one embodiment, the protective cover will substantially cover the topsheet upper surface. In another embodiment, the protective cover will fully cover the topsheet upper surface. In all of the absorbent article embodiments herein where the topsheet upper surface may comprise lotions, surfactants, perfumes, etc.,  
25 the protective cover will at least cover the portion of the topsheet upper surface comprising the above mentioned additives and preferably cover a greater area to further protect the topsheet.

One embodiment of the present invention herein provides a sanitary napkin (or "napkin") for placement of the napkin in a wearer's undergarment which has a  
30 longitudinal axis, a lateral axis, longitudinal edges, end edges, and a central portion. The sanitary napkin comprises a liquid pervious topsheet and a liquid impervious backsheet joined to the topsheet. The topsheet has a bottom surface facing away from a user and an upper or user surface facing towards a user. The backsheet has an outer surface and an inner surface. An absorbent core is positioned between the  
35 topsheet and the backsheet. An attachment system is secured to the outer surface of the backsheet to attach the sanitary napkin to a wearer's undergarment. The upper

surface of the topsheet comprises a protective cover releasably attached thereon having a pair of opposed end edges and a pair of opposed longitudinal edges.

In another embodiment of the present invention, a diaper is provided that comprises a liquid impervious backsheet and a liquid pervious topsheet joined to the backsheet. The topsheet has a bottom surface positioned away from a wearer and an upper or user surface oriented toward the skin of the wearer when the diaper is being worn. Furthermore, an absorbent core is positioned between the topsheet and the backsheet, and a protective cover is releasably attached to the topsheet upper surface or outer surface such that the protective cover at least partially covers the topsheet upper surface.

In one preferred embodiment of the absorbent articles herein, a plurality of microcapsules lie between the topsheet upper surface and the protective cover. More preferably, the microcapsules are embedded within a bonding layer, e.g., adhesive, that holds the microcapsules fast between the topsheet upper surface and protective cover. In practice, a user will remove the protective cover from the topsheet, and in so doing, shear a plurality of the microcapsules thereby breaking them to release lotion or some other such substance onto the topsheet upper surface.

In another embodiment herein, the protective cover is releasably attached to the topsheet upper surface along at least a portion of the sanitary napkin periphery. Also, the protective cover may be releasably attached to the topsheet upper surface inboard of the sanitary napkin periphery.

The protective covers herein are preferably releasably attached to the topsheet upper surface by at least one of several types of attachment means. The attachment means herein may include adhesive attachment means, ultrasonic attachment means, thermal attachment means, mechanical attachment means, dynamic mechanical attachment means (i.e., heat and pressure) and combinations thereof.

In an alternative embodiment herein, the sanitary napkin further comprises a release tab joined to at least one end edge of the protective cover. The release tab is used to pull the protective cover from the topsheet without having to grasp the main portion of the protective cover itself. Also, the release tab may be joined to at least one longitudinal edge of the protective cover.

The protective covers herein are preferably selected from the group consisting of polyethylene films, polypropylene films, nonwoven webs, cellulosic release paper, and combinations thereof.

The sanitary napkin may further comprise a pair of flaps having a user facing side, a garment facing side and an attachment system positioned on the garment side

for attachment of the sanitary napkin to a wearer's undergarment. Each flap is associated with the central portion at a juncture and extends laterally outwardly beyond a longitudinal edge of the central portion. Each juncture has a pair of ends. The flaps are divided into a front half and a back half by a flap transverse centerline.

5        Preferably, the protective cover herein is releasably attached both to the flaps and to the topsheet upper surface. The protective cover on the flaps herein are releasably bonded to the flaps by at least one of various types of attachment means known in the art. Preferred attachment means herein include adhesive attachment means, ultrasonic attachment means, thermal attachment means, mechanical  
10       attachment means and mixtures thereof.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which is regarded as forming the present  
15       invention, it is believed that the invention will be better understood from the following descriptions which are taken in conjunction with the accompanying drawings in which like designations are used to designate substantially identical elements, and in which:

Figure 1 is a plan view of the sanitary napkin embodiment of the present  
20       invention having portions cut-away to reveal underlying structure, the wearer contacting surface of the sanitary napkin facing the viewer;

Figure 2 is a cross-sectional view of the sanitary napkin of Figure 1 taken along section line 2-2;

Figure 2A is a cross-sectional view of the sanitary napkin of Figure 1 showing  
25       the release mechanism in Figure 2;

Figure 3 is a plan view of an alternative sanitary napkin embodiment of the present invention comprising flaps;

Figure 4 is an exploded perspective view of the protective cover and sanitary  
30       napkin of Figure 1 releasably attached to one-another by preferred mechanical attachment means;

Figure 5 is a plan view of the diaper embodiment of the present invention having portions cut away to reveal underlying structure, the wearer contacting surface of the diaper facing the viewer;

Figure 6 is a cross-sectional view of an alternative embodiment herein  
35       comprising microcapsules;

Figure 6A is a cross-sectional view of the alternative embodiment of Figure 6 showing the release mechanism in Figure 6;

Figure 7 is a plan view of an alternative embodiment of a diaper herein; and Figure 8 is a plan view of an alternative embodiment of a diaper herein.

### **DETAILED DESCRIPTION OF THE INVENTION**

5 As used herein, the term "absorbent article" refers to devices which absorb and contain body exudates, and, more specifically, refers to devices which are placed against or in close proximity to the body of the wearer to absorb and contain the various exudates discharged from the body. The term "disposable" is used herein to describe absorbent articles which are not intended to be laundered or otherwise  
10 restored or reused as an absorbent article (i.e., they are intended to be discarded after a single use, and, preferably, to be recycled, composted or otherwise disposed of in an environmentally compatible manner). A "unitary" absorbent article refers to absorbent articles which are formed of separate parts united together to form a coordinated entity so that they do not require separate manipulative parts like a  
15 separate holder and pad.

#### **The Disposable Diaper**

A preferred embodiment of the unitary disposable absorbent article of the present invention is the diaper 50 shown in Fig. 5. As used herein, the term "diaper"  
20 refers to an absorbent article generally worn by infants, and incontinent persons that is worn about the lower torso of the wearer. In other words, the term "diaper" includes infant diapers, training pants, adult incontinence devices, etc.

The diaper 50 of the present invention, as shown in Fig. 5, comprises a liquid impervious backsheet 530 and a liquid pervious topsheet 520 joined to the backsheet  
25 530. The topsheet 520 has a bottom surface (not shown) positioned away from a wearer and an upper surface oriented toward the skin of the wearer when the diaper 50 is being worn. Furthermore, an absorbent core 540 is positioned between the topsheet 520 and the backsheet 530, and a protective cover 125 is releasably attached to the topsheet upper surface or user surface such that the protective cover 125 at  
30 least partially covers the topsheet upper surface.

Figure 5 provides a plan view of the diaper 50 of the present invention in its flat-out, uncontracted state (i.e., with elastic induced contraction pulled out) with portions of the structure being cut-away to more clearly show the construction of the diaper 50 and with the portion of the diaper 50 which faces away from the wearer, the  
35 upper surface, oriented towards the viewer. As shown in Figure 5, the diaper 50 preferably comprises a liquid pervious topsheet 520; a liquid impervious backsheet 530 joined with the topsheet 520; an absorbent core 540 positioned between the

topsheet 520 and the backsheet 530, the absorbent core 540 having a garment facing surface 542, a body facing surface 544 laying oppositely of the garment facing surface 542, side edges 546, and waist edges 548. The diaper 50 preferably further comprises elasticized leg cuffs 550; an elastic waist feature multiply designated as 560; and a fastening system generally multiply designated as 570.

The diaper 50 is shown in Figure 5 to have an outer surface 82, an inner surface 84 opposed to the outer surface 82, a first waist region 86, a second waist region 88, and a periphery 51 which is defined by the outer edges of the diaper 50 in which the longitudinal or side edges are designated 55 and the end edges are designated 57. (While the skilled artisan will recognize that a diaper is usually described in terms of having a pair of waist regions and a crotch region between the waist regions, in this application, for simplicity of terminology, the diaper 50 is described as having only waist regions including a portion of the diaper which would typically be designated as part of the crotch region). The inner surface 84 of the diaper 50 comprises that portion of the diaper 50 which is positioned adjacent to the wearer's body during use (i.e., the inner surface 84 generally is formed by at least a portion of the topsheet 520 and other components that may be joined to the topsheet 520). The outer surface 82 comprises that portion of the diaper 50 which is positioned away from the wearer's body (i.e., the outer surface 82 generally is formed by at least a portion of the backsheet 530 and other components that may be joined to the backsheet 530). (As used herein, the portion of the diaper 50 or components thereof which faces the wearer is also referred to as the body facing surface. Similarly, the portion facing away from the wearer is also referred to herein as the garment facing surface.) The first waist region 86 and the second waist region 88 extend, respectively, from the end edges 57 of the periphery 51 to the lateral centerline 53 of the diaper 50. Figure 5 also shows the longitudinal centerline 59.

Figure 5 shows a preferred embodiment of the diaper 50 in which the topsheet 520 and the backsheet 530 have length and width dimensions generally larger than those of the absorbent core 540. The topsheet 520 and the backsheet 530 extend beyond the edges of the absorbent core 540 to thereby form the periphery 51 of the diaper 50.

Figures 7 and 8 show two alternative embodiments of the diaper 50 herein having varying placement of the protective cover 125. In Fig. 7, the protective cover 125 is placed substantially inboard of the leg cuffs 550. Also, the protective cover 125 comprises a release tab 140 which can be used to remove the protective cover 125 from the topsheet 520. Fig. 8 shows a protective cover 125 which extends laterally outwardly beyond the leg cuffs 550 and laterally outwardly beyond side



edges 55. Preferably, the diaper 50 disclosed in Fig. 8 may be used when a manufacturer desires to protect the leg cuffs 550 of the diaper 50 before its use. Alternatively, the protective cover may extend laterally outwardly beyond the leg cuffs 550 and not beyond the side edges 55.

5 Diapers of the present invention can have a number of well known configurations, with the absorbent cores thereof being adapted to the present invention. Exemplary configurations are described generally in U.S. Patent No. 3,860,003 issued to Buell on January 14, 1975; U.S. Patent No. 5,151,092 issued to Buell et al. on September 29, 1992; U.S. Patent No. 5,221,274 issued to Buell et al.  
10 on June 22, 1993. Each of these patents is incorporated herein by reference. Another diaper configuration to which the present invention can be readily adapted are described in co-pending U.S. Patent Application Serial No. 08/203,456; filed on February 28, 1994 and incorporated herein by reference. The absorbent cores of  
15 diapers described in these patents can be adapted in light of the teachings herein to include the absorbent composite of the present invention as an absorbent gelling material described therein.

A topsheet 520 which is particularly suitable for use in the diaper 50, is carded and thermally bonded by means well known to those skilled in the fabrics art. A satisfactory topsheet for the present invention comprises staple length  
20 polypropylene fibers having a denier of about 2.2. As used herein, the term "staple length fibers" refers to those fibers having a length of at least about 15.9 mm (0.625 inches). Preferably, the topsheet has a basis weight from about 14 to about 25 grams per square meter. A suitable topsheet is manufactured by Veratec, Inc., a Division of International Paper Company, of Walpole, Massachusetts under the designation  
25 P-8.

The topsheet 520 of diaper 50 is preferably made of a hydrophilic material to promote rapid transfer of liquids (e.g., urine) through the topsheet. If the topsheet is made of a hydrophobic material, at least the upper surface of the topsheet is treated to be hydrophilic so that liquids will transfer through the topsheet more rapidly.  
30 This diminishes the likelihood that body exudates will flow off the topsheet rather than being drawn through the topsheet and being absorbed by the absorbent core. The topsheet can be rendered hydrophilic by treating it with a surfactant. Suitable methods for treating the topsheet with a surfactant include spraying the topsheet material with the surfactant and immersing the material into the surfactant. A more  
35 detailed discussion of such a treatment and hydrophilicity is contained in U.S. Patent No. 4,988,344 entitled "Absorbent Articles with Multiple Layer Absorbent Layers" issued to Reising, et al on January 29, 1991 and U.S. Patent No. 4,988,345 entitled

"Absorbent Articles with Rapid Acquiring Absorbent Cores" issued to Reising on January 29, 1991, each of which is incorporated by reference herein.

In a preferred embodiment of a diaper as described herein, the backsheet 530 has a modified hourglass shape extending beyond the absorbent core a minimum distance of about 1.3 cm to about 6.4 cm (about 0.5 to about 2.5 inch) around the entire diaper periphery.

The absorbent core 540 may take on any size or shape that is compatible with the diaper 50. One preferred embodiment of the diaper 50 has an asymmetric, modified T-shaped absorbent core 540 having ears in the first waist region but a generally rectangular shape in the second waist region. Exemplary absorbent structures for use as the absorbent core of the present invention that have achieved wide acceptance and commercial success are described in U.S. Patent No. 4,610,678 entitled "High-Density Absorbent Structures" issued to Weisman et al. on September 9, 1986; U.S. Patent No. 4,673,402 entitled "Absorbent Articles With Dual-Layered Cores" issued to Weisman et al. on June 16, 1987; U.S. Patent No. 4,888,231 entitled "Absorbent Core Having A Dusting Layer" issued to Angstadt on December 19, 1989; and U.S. Patent No. 4,834,735, entitled "High Density Absorbent Members Having Lower Density and Lower Basis Weight Acquisition Zones", issued to Alemany et al. on May 30, 1989. The absorbent core may further comprise the dual core system containing an acquisition/distribution core of chemically stiffened fibers positioned over an absorbent storage core as detailed in U.S. Patent No. 5,234,423, entitled "Absorbent Article With Elastic Waist Feature and Enhanced Absorbency" issued to Alemany et al., on August 10, 1993; and in U.S. Patent No. 5,147,345, entitled "High Efficiency Absorbent Articles For Incontinence Management" issued to Young, LaVon and Taylor on September 15, 1992. All of these patents are incorporated herein by reference.

The backsheet and the topsheet are positioned adjacent the garment surface and the body surface, respectively, of the absorbent core. The absorbent core is preferably joined with the topsheet, the backsheet, or both in any manner as is known by attachment means (not shown in Figure 5) such as those well known in the art. However, embodiments of the present invention are envisioned wherein portions of the entire absorbent core are unattached to either the topsheet, the backsheet, or both.

For example, the backsheet and/or the topsheet may be secured to the absorbent core or to each other by a uniform continuous layer of adhesive, a patterned layer of adhesive, or an array of separate lines, spirals, or spots of adhesive. Adhesives which have been found to be satisfactory are manufactured by H. B. Fuller

Company of St. Paul, Minnesota under the designation HL-1258 or H-2031. The attachment means will preferably comprise an open pattern network of filaments of adhesive as is disclosed in U.S. Patent No. 4,573,986, issued to Minetola, et al. on March 4, 1986, and which is incorporated herein by reference. An exemplary  
5 attachment means of an open pattern network of filaments comprises several lines of adhesive filaments swirled into a spiral pattern such as illustrated by the apparatus and method shown in U.S. Patent No. 3,911,173 issued to Sprague, Jr. on October 7, 1975; U.S. Patent No. 4,785,996 issued to Zwieker, et al. on November 22, 1978; and U.S. Patent No. 4,842,666 issued to Werenicz on June 27, 1989. Each of these  
10 patents are incorporated herein by reference. Alternatively, the attachment means may comprise heat bonds, pressure bonds, ultrasonic bonds, dynamic mechanical bonds, or any other suitable attachment means or combinations of these attachment means as are known in the art.

In a preferred embodiment, the diaper 50 further comprises elasticized leg  
15 cuffs 550 for providing improved containment of liquids and other body exudates; an elastic waist feature 560 that provides improved fit and containment; and a fastening system 570 which forms a side closure which maintains the first waist region 86 and the second waist region 88 in an overlapping configuration such that lateral tensions are maintained around the circumference of the diaper to maintain the diaper on the  
20 wearer. The diaper 50 may also comprise elasticized side panels (not shown) in the waist regions 86 and 88 to provide an elastically extensible feature that provides a more comfortable and contouring fit and more effective application of the diaper 50.

The elasticized leg cuffs 550 can be constructed in a number of different configurations, including those described in U.S. Patent No. 3,860,003 issued to  
25 Buell on Jan. 14, 1975; U.S. Patent No. 4,909,803, issued to Aziz et al. on Mar. 20, 1990; U.S. Patent No. 4,695,278, issued to Lawson on Sept. 22, 1987; and U.S. Patent No. 4,795,454, issued to Dragoo on Jan. 3, 1989, each of which are incorporated herein by reference.

The elasticized waist feature preferably comprises an elasticized waistband  
30 (not shown) that may be constructed in a number of different configurations including those described in U.S. Patent No. 4,515,595 issued to Kievit et al. on May 7, 1985; U.S. Patent No. 5,026,364 issued to Robertson on Jun. 25, 1991; and the above referenced U.S. Patent No. 5,151,092 issued to Buell et al. on Sept. 29, 1992, each of which are incorporated herein by reference.

35 The elasticized side panels may be constructed in a number of configurations. Examples of diapers with elasticized side panels positioned in the ears (ear flaps) of the diaper are disclosed in U.S. Patent No. 4,857,067, issued to Wood, et al. on Aug.

15, 1989; U.S. Patent No. 4,381,781, issued to Sciaraffa, et al. on May 3, 1983; U.S. Patent No. 4,938,753, issued to Van Gompel, et al. on Jul. 3, 1990; and U.S. Patent No. 5,151,092, issued to Buell et al. on Sept. 29, 1992; each of which are incorporated herein by reference.

5 Exemplary fastening systems 570 are disclosed in U.S. Patent No. 4,846,815, issued to Scripps on Jul. 11, 1989; U.S. Patent No. 4,894,060, issued to Nestegard on Jan. 16, 1990; U.S. Patent No. 4,946,527, issued to Battrell on Aug. 7, 1990; U.S. Patent No. 3,848,594, issued to Buell on Nov. 19, 1974; U.S. Patent No. B1 4,662,875, issued to Hirotsu et al. on May 5, 1987; and U.S. Patent No. 5,151,092,  
10 issued to Buell et al. on Sept. 29, 1992; each of which are incorporated herein by reference.

The diaper 50 is preferably applied to a wearer by positioning one of the waist regions of the diaper, preferably the second waist region 88, under the wearer's back and drawing the remainder of the diaper between the wearer's legs so that the other  
15 waist region, preferably the first waist region 86, is positioned across the front of the wearer. The fastening system is then applied to effect a side closure.

The protective covers of the present invention are also useful in training pants. The term "training pants", as used herein, refers to disposable garments having fixed sides and leg openings. Training pants are placed in position on the  
20 wearer by inserting the wearer's legs into the leg openings and sliding the training pant into position about the wearer's lower torso. Suitable training pants are disclosed in U.S. Patent No. 5,246,433, issued to Hasse, et al. on September 21, 1993 which is incorporated herein by reference.

Another disposable absorbent article for which the protective covers of the  
25 present invention are useful are incontinence articles. The term "incontinence article" refers to pads, undergarments (pads held in place by a suspension system of the same type, such as a belt, or the like), inserts for absorbent articles, capacity boosters for absorbent articles, briefs, bed pads, and the like regardless of whether they are worn by adults or other incontinent persons. Suitable incontinence articles  
30 are disclosed in U.S. Patent No. 4,253,461 issued to Strickland, et al. on March 3, 1981; U.S. Patent Nos. 4,597,760 and 4,597,761 each issuing to Buell on July 1, 1986; U.S. Patent No. 4,704,115 issued to Buell on November 3, 1987; U.S. Patent No. 4,909,802 issued to Ahr, et al.; U.S. Patent No. 4,964,860 issued to Gipson, et al. on October 23, 1990; and in U.S. Patent Application Serial No. 07/637,090 filed  
35 by Noel, et al. on January 3, 1991 (PCT Publication No. WO 92/11830 published on July 23, 1992).

### The Sanitary Napkin

Another embodiment of a unitary disposable absorbent article of the present invention is the catamenial pad, sanitary napkin 20, shown in Figure 1. As used herein, the term "sanitary napkin" or "napkin" refers to an absorbent article which is worn by females adjacent to the pudendal region, generally external to the urogenital region, and which is intended to absorb and contain menstrual fluids and other vaginal discharges from the wearer's body (e.g., blood, menses, and urine). Interlabial devices which reside partially within and partially external of the wearer's vestibule are also within the scope of this invention. As used herein, the term "pudendal" refers to the externally visible female genitalia. It should be understood, however, that the present invention is also applicable to other feminine hygiene or catamenial pads such as pantliners, or other absorbent articles such as incontinence pads, and the like.

Figure 1 is a plan view of the sanitary napkin 20 of the present invention in its flat-out state with portions of the structure being cut-away to more clearly show the construction of the sanitary napkin 20 and with the portion of the sanitary napkin 20 which faces or contacts the wearer, oriented towards the viewer. The sanitary napkin 20 comprises a longitudinal axis 15, a lateral axis 17, longitudinal edges 34, end edges 32, and a central portion 38. The sanitary napkin 20 further comprises a liquid pervious topsheet 24 and a liquid impervious backsheet 26 joined to the topsheet 24. The topsheet 24 has a bottom surface 31 (not shown) facing away from a user and an upper or user surface 27 facing towards a user. The backsheet 26 has an outer surface 42 (or garment surface, not shown) facing away from a user when worn and an inner surface 44 (or wearer surface) facing towards a user when worn. An absorbent core 28 is positioned between the topsheet 24 and the backsheet 26. An attachment system 100 (not shown) is secured to the outer surface 42 of the backsheet 26 to attach the sanitary napkin 20 to a wearer's undergarment. The upper surface 27 of the topsheet 24 comprises a protective cover 25 that is releasably attached to at least a portion of the topsheet upper surface 27. The protective cover 25 has a pair of opposed end edges 37 and a pair of opposed longitudinal edges 39.

The sanitary napkin 20 has two surfaces, a body-contacting or body facing surface or body surface and a garment surface. The body surface is that surface that lies adjacent to a user's pudendal region when the sanitary napkin 20 is worn. The garment surface is that surface positioned away from a user's pudendal region when the sanitary napkin 20 is worn. The sanitary napkin 20 is shown in Figure 1 as viewed from its body facing surface. The body facing surface is intended to be placed adjacent to the body of the wearer while the garment surface is on the

opposite side and is intended to be placed adjacent to the wearer's undergarments when the sanitary napkin 20 is worn. The sanitary napkin 20 has two centerlines; i.e., a longitudinal centerline 15 and a transverse centerline 17. The term "longitudinal", as used herein, refers to a line, axis or direction in the plane of the sanitary napkin 20 that is generally aligned with (e.g., approximately parallel to) a vertical plane which bisects a standing wearer into left and right body halves when the sanitary napkin 20 is worn. The terms "transverse" or "lateral" as used herein, are interchangeable, and refer to a line, axis or direction which lies within the plane of the sanitary napkin 20 that is generally perpendicular to the longitudinal direction. Figure 1 also shows that the sanitary napkin 20 has a periphery 30 which is defined by the outer edges of the sanitary napkin 20 in which the longitudinal edges are designated 34 and the end edges are designated 32. The central portion 38 of the sanitary napkin 20 is that portion of the napkin 20 that will preferably comprise most and more preferably all of the additives disclosed for application herein to a topsheet 24, e.g., some additives being lotion, surfactant, emollients, etc.

While the topsheet, the backsheet, and the absorbent core may be assembled in a variety of well known configurations (including so called "tube" products or side flap products), preferred sanitary napkin configurations are described generally in U.S. Patent No. 4,950,264, "Thin, Flexible Sanitary Napkin" issued to Osborn on August 21, 1990; U.S. Patent No. 4,425,130, "Compound Sanitary Napkin" issued to DesMarais on January 10, 1984; U.S. Patent No. 4,321,924, "Bordered Disposable Absorbent Article" issued to Ahr on March 30, 1982; U.S. Patent No. 4,589,876, "Shaped Sanitary Napkin With Flaps" issued to Van Tilburg on August 18, 1987. Each of these patents are hereby incorporated herein by reference. Figure 1 shows a preferred embodiment of the sanitary napkin 20 in which the topsheet 24 and the backsheet 26 have length and width dimensions generally larger than those of the absorbent core 28. The topsheet 24 and the backsheet 26 can extend beyond the edges of the absorbent core 28 to thereby form not only portions of the periphery but also side flaps.

Figure 2 is a cross-sectional view of the sanitary napkin 20 taken along section line 2-2 of Figure 1. Figure 2 shows portions of the protective cover 25, the topsheet 24, the absorbent core 28, the backsheet 26 and the release tab 40 which is joined to, and preferably is an extended portion of the protective cover 25. Figure 2A shows the protective cover 25 being pulled from the topsheet 24 by the release tab 40 in a direction away from the surface of the sanitary napkin 20. Note, the presence of the release tab 40 is a preferred embodiment and is not therefore necessary to the practice of the enclosed invention. Without the release tab 40, a user could simply

grasp the protective cover 25 at any point along a protective cover edge (i.e., end edge 37 or longitudinal edge 39--See Fig. 1) convenient for a user to pull the cover 25 from the napkin 20. However, in those circumstances where a user prefers to avoid even slight contact with the topsheet surface 27 before its use, a release tab 40  
5 should be employed to avoid such contact. In fact, where a user may be or have been previously suffering from a urogenital disease or infection, and the use of a sanitary and essentially contaminant-free napkin is critical, the tab 40 should be a part of the cover 25 to engender user confidence and to better keep contaminants borne on a user's hands away from the topsheet user surface 27.

10 The absorbent core 28 may be any absorbent means which is capable of absorbing or retaining liquids (e.g., menses and/or urine). As shown in Figure 1, the absorbent core 28 has a body surface, a garment surface, side edges, and pad edges. The absorbent core 28 may be manufactured in a wide variety of sizes and shapes (e.g., rectangular, oval, hourglass, dog bone, asymmetric, etc.) and from a wide  
15 variety of liquid-absorbent materials commonly used in sanitary napkins and other absorbent articles such as comminuted wood pulp which is generally referred to as airfelt. Examples of other suitable absorbent materials include creped cellulose wadding; meltblown polymers including coform; chemically stiffened, modified or cross-linked cellulosic fibers; synthetic fibers such as crimped polyester fibers; peat  
20 moss; tissue including tissue wraps and tissue laminates; absorbent foams; absorbent sponges; superabsorbent polymers; absorbent gelling materials; or any equivalent material or combinations of materials, or mixtures of these. The configuration and construction of the absorbent core may also be varied (e.g., the absorbent core may have varying caliper zones (e.g., profiled so as to be thicker in the center),  
25 hydrophilic gradients, superabsorbent gradients, or lower density and lower average basis weight acquisition zones; or may comprise one or more layers or structures). The total absorbent capacity of the absorbent core should, however, be compatible with the design loading and the intended use of the sanitary napkin. Further, the size and absorbent capacity of the absorbent core may be varied to accommodate  
30 different uses such as incontinence pads, pantliners, regular sanitary napkins, or overnight sanitary napkins.

Exemplary absorbent structures for use as the absorbent core of the present invention are described in U.S. Patent No. 4,950,264 entitled "Thin, Flexible Sanitary Napkin" issued to Osborn on August 21, 1990; U.S. Patent No. 4,610,678  
35 entitled "High-Density Absorbent Structures" issued to Weisman et al. on September 9, 1986; U.S. Patent No. 4,834,735 entitled "High Density Absorbent Members Having Lower Density and Lower Basis Weight Acquisition Zones", issued to

Alemaný et al. on May 30, 1989; and European Patent Application No. 0 198 683, The Procter & Gamble Company, published October 22, 1986 in the name of Duenk, et al. Each of these patents are incorporated herein by reference.

5 The backsheet 26 and the topsheet 24 are positioned adjacent the garment surface and the body surface, respectively, of the absorbent core 28 and are preferably joined thereto and to each other by attachment means (not shown) such as those well known in the art. For example, the backsheet 26 and/or the topsheet 24 may be secured to the absorbent core 28 or to each other by a uniform continuous layer of adhesive, a patterned layer of adhesive, or an array of separate lines, spirals, 10 or spots of adhesive. Adhesives which have been found to be satisfactory are manufactured by H. B. Fuller Company of St. Paul, Minnesota under the designation HL-1258 or H-2031. The attachment means will preferably comprise an open pattern network of filaments of adhesive as is disclosed in U.S. Patent No. 4,573,986 entitled "Disposable Waste-Containment Garment", which issued to Minetola, et al. 15 on March 4, 1986, and which is incorporated herein by reference. An exemplary attachment means of an open pattern network of filaments comprises several lines of adhesive filaments swirled into a spiral pattern such as illustrated by the apparatus and method shown in U.S. Patent No. 3,911,173 issued to Sprague, Jr. on October 7, 1975; U.S. Patent No. 4,785,996 issued to Zieker, et al. on November 22, 1978; and 20 U.S. Patent No. 4,842,666 issued to Werenicz on June 27, 1989. Each of these patents are incorporated herein by reference. Alternatively, the attachment means may comprise heat bonds, pressure bonds, ultrasonic bonds, dynamic mechanical bonds, or any other suitable attachment means or combinations of these attachment means as are known in the art.

25 The backsheet 26 is impervious to liquids (e.g., menses and/or urine) and is preferably manufactured from a thin plastic film, although other flexible liquid impervious materials may also be used. As used herein, the term "flexible" refers to materials which are compliant and will readily conform to the general shape and contours of the human body. The backsheet 26 prevents the exudates absorbed and 30 contained in the absorbent core 28 from wetting articles which contact the sanitary napkin 20 such as pants, pajamas and undergarments. The backsheet 26 may thus comprise a woven or nonwoven material, polymeric films such as thermoplastic films of polyethylene or polypropylene, or composite materials such as a film-coated nonwoven material. Preferably, the backsheet is a polyethylene film having a 35 thickness of from about 0.012 mm (0.5 mil) to about 0.051 mm (2.0 mils). Exemplary polyethylene films are manufactured by Clopay Corporation of Cincinnati, Ohio, under the designation P18-0401 and by Ethyl Corporation,



Visqueen Division, of Terre Haute, Indiana, under the designation XP-39385. The backsheet is preferably embossed and/or matte finished to provide a more clothlike appearance. Further, the backsheet 26 may permit vapors to escape from the absorbent core 28 (i.e., breathable) while still preventing exudates from passing through the backsheet 26.

The topsheet 24 is compliant, soft feeling, and non-irritating to the wearer's skin. Further, the topsheet 24 is liquid pervious permitting liquids (e.g., menses and/or urine) to readily penetrate through its thickness. A suitable topsheet 24 may be manufactured from a wide range of materials such as woven and nonwoven materials; polymeric materials such as apertured formed thermoplastic films, apertured plastic films, and hydroformed thermoplastic films; porous foams; reticulated foams; reticulated thermoplastic films; and thermoplastic scrims. Suitable woven and nonwoven materials can be comprised of natural fibers (e.g., wood or cotton fibers), synthetic fibers (e.g., polymeric fibers such as polyester, polypropylene, or polyethylene fibers) or from a combination of natural and synthetic fibers. A preferred topsheet comprises an apertured formed film. Apertured formed films are preferred for the topsheet because they are pervious to body exudates and yet non-absorbent and have a reduced tendency to allow liquids to pass back through and rewet the wearer's skin. Thus, the surface of the formed film which is in contact with the body remains dry, thereby reducing body soiling and creating a more comfortable feel for the wearer. Suitable formed films are described in U.S. Patent No. 3,929,135, entitled "Absorptive Structures Having Tapered Capillaries", which issued to Thompson on December 30, 1975; U.S. Patent No. 4,324,246 entitled "Disposable Absorbent Article Having A Stain Resistant Topsheet", which issued to Mullane, et al. on April 13, 1982; U.S. Patent No. 4,342,314 entitled "Resilient Plastic Web Exhibiting Fiber-Like Properties", which issued to Radel, et al. on August 3, 1982; U.S. Patent No. 4,463,045 entitled "Macroscopically Expanded Three-Dimensional Plastic Web Exhibiting Non-Glossy Visible Surface and Cloth-Like Tactile Impression", which issued to Ahr et al. on July 31, 1984; and U.S. Patent No. 5,006,394 "Multilayer Polymeric Film" issued to Baird on April 9, 1991. Each of these patents are incorporated herein by reference. The preferred topsheet for the present invention is the formed film described in one or more of the above patents and marketed on sanitary napkins by The Procter & Gamble Company of Cincinnati, Ohio as "DRI-WEAVE".

In a preferred embodiment of the present invention, the body surface of the formed film topsheet is hydrophilic so as to help liquids to transfer through the topsheet faster than if the body surface was not hydrophilic so as to diminish the

likelihood that menstrual fluid will flow off the topsheet rather than flowing into and being absorbed by the absorbent core. In a preferred embodiment, surfactant is incorporated into the polymeric materials of the formed film topsheet such as is described in U.S. Patent Application Serial No. 07/794,745, "Absorbent Article  
5 Having A Nonwoven and Apertured Film Coversheet" filed on November 19, 1991 by Aziz, et al., which is incorporated herein by reference. Alternatively, the body surface of the topsheet can be made hydrophilic by treating it with a surfactant such as is described in the above referenced U.S. Patent No. 4,950,254 issued to Osborn, and is incorporated herein by reference.

10 In use, the sanitary napkin 20 can be held in place by any support means or attachment means (not shown) well-known for such purposes. Preferably, the sanitary napkin is placed in the user's undergarment or panty and secured thereto by a fastener such as an adhesive. The adhesive provides a means for securing the sanitary napkin in the crotch portion of the panty. Thus, a portion or all of the outer  
15 surface 42 (not shown) of the backsheet 26 is coated with adhesive. Any adhesive or glue used in the art for such purposes can be used for the adhesive herein, with pressure-sensitive adhesives being preferred. Suitable adhesives are Century A-305-IV manufactured by the Century Adhesives Corporation of Columbus, Ohio; and Instant Lock 34-2823 manufactured by the National Starch and Chemical Company  
20 of Bridgewater, NJ. Suitable adhesive fasteners are also described in U.S. Patent No. 4,917,697. Before the sanitary napkin is placed in use, the pressure-sensitive adhesive is typically covered with a removable release liner in order to keep the adhesive from drying out or adhering to a surface other than the crotch portion of the panty prior to use. Suitable release liners are also described in the above-referenced  
25 U.S. Patent No. 4,917,697. Any commercially available release liners commonly used for such purposes can be utilized herein. Non-limiting examples of suitable release liners are BL30MG-A Silox E1/O and BL30MG-A Silox 4P/O both of which are manufactured by the Akrosil Corporation of Menasha, WI. The sanitary napkin 20 of the present invention is used by removing the release liner and thereafter  
30 placing the sanitary napkin in a panty so that the adhesive contacts the panty. The adhesive maintains the sanitary napkin in its position within the panty during use.

Figure 3 shows a preferred embodiment of the present invention wherein the sanitary napkin 20 has two flaps 52, each of which are adjacent to and extend laterally from the side edges 34 of the sanitary napkin 20. The flaps 52 are  
35 configured to drape over the edges of the wearer's panties in the crotch region so that the flaps 52 are disposed between the edges of the wearer's panties and thighs. The flaps 52 serve at least two purposes. Firstly, the flaps 52 help serve to prevent

soiling of the wearer's body and panties by menstrual fluid, preferably by forming a double wall barrier along the edges of the panty. Secondly, the flaps 52 are preferably provided with attachment means 54 on their garment surface so that the flaps 52 can be folded back under the panty and attached to the garment facing side of the panty. In this way, the flaps 52 serve to keep the sanitary napkin 20 properly positioned in the panty. The flaps 52 can be constructed of various materials including materials similar to the topsheet, backsheet, tissue, or combination of these materials. Further, the flaps 52 may be a separate element attached to the main body of the napkin 20 or can comprise extensions of the topsheet and backsheet (i.e., unitary). A number of sanitary napkins having flaps suitable or adaptable for use with the sanitary napkins of the present invention are disclosed in U.S. Patent No. 4,687,478 entitled "Shaped Sanitary Napkin With Flaps", which issued to Van Tilburg on August 18, 1987; U.S. Patent No. 4,589,876 entitled "Sanitary Napkin", which issued to Van Tilburg on May 20, 1986; and U.S. Patent No. 4,608,047, entitled "Sanitary Napkin Attachment Means", which issued to Mattingly on August 26, 1986. Each of these patents are incorporated herein by reference.

In a preferred embodiment herein, the flaps 52 comprise an attachment means 54 having hooks. The hooks may have a mating element known as loops, but more preferably, the hooks will themselves be attachable to the nonwoven surface of the flaps. Exemplary attachment systems comprising hook and loop fastening materials are disclosed in U.S. Patent No. 4,869,724 issued to Scripps on September 26, 1989. Attachment systems utilizing mechanical closure elements are also disclosed in U.S. Patent No. 4,846,815 issued to Scripps on July 11, 1989; and U.S. Patent No. 4,894,060 issued to Nestegard on January 16, 1990. Attachment systems having combination adhesive/mechanical closure elements are described in U.S. Patent No. 4,946,527 issued to Battrell on August 7, 1990. Each of these patents are incorporated herein by reference.

In a preferred embodiment of the present invention, an acquisition layer(s) (not shown) may be positioned between the topsheet and the absorbent core. The acquisition layer may serve several functions including improving wicking of exudates over and into the absorbent core. There are several reasons why the improved wicking of exudates is important, including providing a more even distribution of the exudates throughout the absorbent core and allowing the sanitary napkin 20 to be made relatively thin. (The wicking referred to herein may encompass the transportation of liquids in one, two or all directions (i.e., in the x-y plane and/or in the z-direction). The acquisition layer may be comprised of several different materials including nonwoven or woven webs of synthetic fibers including

polyester, polypropylene, or polyethylene; natural fibers including cotton or cellulose; blends of such fibers; or any equivalent materials or combinations of materials. Additionally, crimped, synthetic fibers of the aforementioned as well as chemically stiffened, cellulosic fibers may be used. Examples of sanitary napkins having an acquisition layer and a topsheet are more fully described in U.S. Patent No. 4,950,264 issued to Osborn and U.S. Patent Application Serial No. 07/810,774, "Absorbent Article Having Fused Layers", filed December 17, 1991 in the names of Cree, et al. Each of these references are incorporated herein by reference. In a preferred embodiment, the acquisition layer may be joined with the topsheet by any of the conventional means for joining webs together, most preferably by fusion bonds as is more fully described in the above-referenced Cree application.

Figure 4 offers an exploded perspective view of the sanitary napkin 20 in Figure 1 whereby the protective cover 25 is positioned above the napkin 20. Both the cover 25 and the napkin periphery 30 comprise crimps or embossments to mechanically attach the cover 25 and napkin 20 together. In practice, the cover 25 and napkin 20 are held in close contact to one-another and then subsequently embossed or crimped together to effect a mechanical attachment means. Where the cover 25 extends to the napkin periphery 30, this type of attachment means is a preferred attachment means for the napkin 20 herein. U.S. Patent Application 08/734,679 entitled "Combination Absorbent Article" describes this attachment means in more detail and is hereby incorporated herein by reference. Furthermore, U.S. Patent No. 5,181,801 issued to Chappell, et al. on May 21, 1996 describes a preferred type of embossing for use herein and is also incorporated by reference herein.

#### The Protective Cover

The protective cover herein comprises a pair of opposed end edges and a pair of opposed longitudinal edges. Furthermore, the protective cover is releasably attached to the topsheet upper surface and may be formed from one or more types of polymeric film and/or cellulosic/paper materials.

Various types of materials for the protective cover may be used for all embodiments disclosed herein, i.e., the sanitary napkin 20, diaper 50 and other disclosed absorbent articles. Suitable materials for the protective cover include the following:

#### Film-based materials

- 2.0 mil high-density polyethylene film silicone coated on one side;

- 2.5 mil low-density polyethylene film silicone coated on one side;
- 1.6 mil coextruded film silicone coated on one side;
- 1.0 mil polyester (PET) film silicone coated on one side;
- 2.0 mil polyester (PET) film silicone coated on one side;

5

Paper-based materials

- 40 lb. (basis weight\*) bleached machine glazed paper, with a basecoat of 0.85 mil of high-density polyethylene on one side with a silicone coating applied over the polyethylene;
- 10 • 20 lb. (basis weight\*) bleached machine glazed paper, with a basecoat of 0.35 mil of low-density polyethylene on one side, with a silicone coating applied over the polyethylene;
- 35 lb. (basis weight\*) unbleached machine glazed paper, with basecoats of 0.75 mil of high-density polyethylene on each side, with silicone coatings applied over both polyethylene coatings; and
- 15 • 25 lb. (basis weight\*) semi-bleached machine glazed paper, with a basecoat of polyvinyl alcohol (PVA) on one side, with a silicone coating applied over the PVA.

20 Any one of the above film-based or cellulosic/paper-based materials is suitable for use in the protective cover herein. Furthermore, combinations of the above materials are also suitable for use herein.

The purpose of the protective cover is to protect the topsheet of the various absorbent articles disclosed herein from all manner of inadvertent contamination before use of the articles. For example, the sanitary napkins 20 herein are designed primarily for the use of feminine protection during menstruation. A napkin herein is to be placed in close proximity to a female's urogenital region and in most cases are positioned directly adjacent to this region. While napkins 20 of the kind herein are made to be sanitary and are most often sufficiently packaged to prevent inadvertent contamination, the need still persists to provide additional security to a user, especially for a user who may have unpackaged a napkin for a considerable amount of time before its use and/or a user who may be particularly sensitive to disease or infection at or near her urogenital region.

35 The protective covers herein are therefore designed to cover, by a suitable attachment means, the upper surfaces of the various topsheets disclosed herein. A protective cover on the topsheet also provides additional protection to a user who may require such additional care in the instance where a user may be suffering from

a type of urogenital infection that requires special care by the user. Furthermore, the protective cover, by keeping additional contaminants away from the topsheet, may provide additional comfort to a user who may be unusually sensitive to such contaminants; e.g., pollen, dust, airborne pathogens, etc.

5 In addition to protecting a user from unwanted contaminants, the protective cover may be used in tandem with, for example, a surfactant-loaded, medicated and/or lotioned topsheet that would be best used with only minimal exposure to the atmosphere. In one alternative embodiment herein, the protective cover herein can be attached to microcapsules holding any of a number of substances such as  
10 perfume, lotion, medicine, emollients, oils, cyclodextrin's, while also being attached to the topsheet. When the protective cover is removed, the microcapsules burst, thus releasing their substance onto the topsheet, and/or into the air. A detailed description of such microcapsules and their release mechanisms can be found in U.S. Patent No. 5,591,146 issued to Hasse on Jan. 7, 1997 and U.S. Patent No. 5,429,628  
15 issued to Trinh, et al. on July 4, 1995 each of which are incorporated by reference herein.

A protective cover may be attached either adjacent to at least a portion of the periphery of an absorbent article herein or it may be attached inboard of, say, the periphery 30 of the sanitary napkin 20. Whatever the placement, the protective  
20 cover may be attached to an absorbent article by attachment means which may include adhesive attachment means, thermal attachment means, ultrasonic attachment means, mechanical attachment means, dynamic mechanical means (i.e., heat and pressure) and combinations thereof.

Typical thermal attachment of a topsheet protective cover herein comprises  
25 thermal bonds made at one or more points between the protective cover and topsheet and/or absorbent article periphery by means well known in the art. Such means may include a hot knife, two opposed pressure applicators, or any of the other known methods in the art for bonding topsheet and film and/or cellulosic surfaces with nonwoven webs and/or polymeric materials.

30 Typical ultrasonic attachment of a topsheet protective cover herein comprises ultrasonic bonds or attachments made at one or more points between the protective cover and the absorbent article periphery by means well known in the art for the ultrasonic bonding of nonwovens, polymeric materials and/or cellulosic materials together or to themselves. Such means may include an ultrasonic horn of the type  
35 used for bonding for diaper and/or sanitary napkin construction. Such bonding is disclosed in U.S. Patent No. 5,246,433 issued to Hasse, et al. on September 21,

1993 and U.S. Patent No. 5,236,430 issued to Bridges on August 17, 1993, each patent being incorporated by reference herein.

Typical mechanical attachment herein comprises the forming of a bond, without adhesive, between a topsheet protective cover and the upper surface of an absorbent article herein. Such bonds are preferably formed herein by crimps/embossments, i.e., the crimping or embossing of the edges of the protective cover and peripheral edges of an absorbent article herein to form a releasable, mechanical bond between the two. Such mechanical bonding is disclosed in U.S. Patent Application No. 08/734,679 and is hereby incorporated by reference herein.

Typical dynamic mechanical attachment herein comprises the forming of a bond, preferably without adhesive, between the peripheral edges of the protective cover and the periphery of an absorbent article. In practice, a hot press device is used to simultaneously heat and hold the protective cover peripheral edges and absorbent article periphery together until slight melting occurs between them. As the slight melt occurs, the two peripheries are pressed and held together, thus forming a bond due to heat and pressure.

It is noted herein that a preferred embodiment of the protective covers herein will comprise sufficient elasticity and/or flexibility so as not to significantly bunch, gap or gather along the periphery of the cover. For example, when an absorbent article having a protective cover releasably attached thereto is folded for packaging or folded by a user for storage purposes, the protective cover will preferably not release a substantial portion of its attachment to a topsheet upper surface thereby causing gaps. That is, the protective cover, if folded or otherwise manipulated out of the x-y plane, will substantially not lose its position or provide holes or gaps through which a contaminate might enter. This is an important requirement in that the cover, in the event that normal forces are placed upon it, must substantially remain in place prior to the use of the absorbent article. By the term "normal forces" it is meant herein those forces common to handling, packaging and transportation of absorbent articles herein.

#### Lotioned Topsheets

In an alternative embodiment herein, the topsheets of the various absorbent articles disclosed herein, e.g., sanitary napkins, diapers, etc., may comprise one or more of several types of lotions. By the term "lotion" it is meant herein a fluid or partially fluid (i.e., semi-solid) substance comprising one or more emollients, one or more immobilizing agents for use with the emollient(s), optionally a hydrophilic surfactant, and other optional components. Lotion and lotioned topsheets of the type

disclosed herein are taught in U.S. Patent Application No. 08/345,105 entitled "Diaper Having A Lotioned Topsheet Containing A Polysiloxane Emollient" and U.S. Patent Application No. 08/345,159 entitled "Diaper Having A Lotioned Topsheet", the disclosure of each being hereby incorporated by reference herein.

5 As is disclosed in the above-mentioned patent applications, the lotion compositions of the present invention are solid, or more often semisolid, at 20°C, i.e. at ambient temperatures. By "semisolid" it is meant herein that the lotion composition has a rheology typical of pseudoplastic or plastic fluids. When no shear is applied, the lotion compositions can have the appearance of a semi-solid but can  
10 be made to flow as the shear rate is increased. This is due to the fact that, while the lotion composition contains primarily solid components, it also includes some minor liquid components.

The lotion compositions of the present invention are preferably at least semi-solid at room temperature to minimize lotion migration. In addition, the lotion  
15 compositions preferably have a final melting point (100% liquid) above potential "stressful" storage conditions that can be greater than 45°C (e.g., warehouse in Arizona, car trunk in Florida, etc.).

By being solid or semisolid at ambient temperatures, these lotion compositions do not have a tendency to flow and migrate into the interior of the  
20 diaper topsheet to which they are applied. This means less lotion composition is available for imparting desirable therapeutic or protective coating lotion benefits.

When applied to the upper surface of the absorbent article topsheets, the lotion compositions of the present invention are transferable to the wearer's skin by normal contact, wearer motion, and/or body heat. Importantly, the lotions disclosed  
25 in the present invention reduce the adherence of body exudates, (e.g., BM, menses, urine) to the skin of the wearer, thereby improving the ease of clean up from such exudate discharges.

In one preferred embodiment herein, the absorbent article topsheets of the present invention contain an effective amount of the lotion composition. As used  
30 herein, the term "effective amount of a lotion coating" refers to an amount of a particular lotion composition which, when applied to an article topsheet, will be effective in reducing the adherence of body exudates (e.g., BM, menses, urine) to the skin of the wearer. Of course, the effective amount of a lotion coating will depend, to a large extent, on the particular lotion composition used.

35 The lotion compositions of the present invention preferably comprise: (1) an emollient(s); (2) an immobilizing agent(s) for the emollient; (3) optionally a hydrophilic surfactant(s); and (4) other optional components.



The viscosity of the formulated lotion compositions, including emollient, immobilizing agent, and optional components should be as high as possible to keep the lotion from flowing into the interior of the diaper. Unfortunately, high viscosities can also lead to lotion compositions that are difficult to apply without processing problems. Therefore, a balance must be achieved so that the viscosities are high enough to keep the lotion compositions localized on the surface of the diaper topsheet, but not so high as to cause processing problems. Suitable viscosities for the lotion compositions will typically range from about 5 to about 200 centipoises, preferably from about 15 to about 100 centipoises, measured at 60°C.

The lotioned topsheets herein may comprise a lotion which is tacky enough to allow the protective covers disclosed to be attached to a topsheet without the use of adhesives. By the term "tacky" it is meant herein a substance such as a lotion herein that is somewhat sticky or adhesive to the touch. Preferably, a lotion formed to be tacky will provide a sufficient degree of stickiness so as to maintain a protective cover in place on a topsheet prior to its removal by a user without the use of adhesive.

In an alternative embodiment using lotion herein, microcapsules 160 containing lotion 165, or some such other suitable substance (e.g., medicinal ointments, perfume, oils, etc.) may be fixed between the topsheet upper surface of an absorbent article (e.g., a diaper 50 or sanitary napkin 20) herein and the protective cover 225. Figure 6 shows a side view whereby microcapsules 160 are positioned between the topsheet upper surface 127 and protective cover 225. Preferably, the microcapsules 160 are fixed within a bonding layer 155 such as adhesive. Note, this bonding layer 155 may comprise any material suitable for the bonding of the microcapsules 160 to the topsheet 220 and/or the protective cover 225 that is non-irritating to a wearer, yet effective for causing microcapsule shear at removal of the protective cover 225 from the topsheet 220.

If the bonding layer 155 comprises an adhesive, the adhesive can be the same adhesive composition previously disclosed in absorbent articles herein for attaching the protective cover to the article outer surface (e.g., the topsheet upper surface). Whatever suitable adhesive is used to fix the microcapsules 160 between the topsheet upper surface 127 and the protective cover 225, it must be non-toxic and non-irritating to a user's skin. Preferably, when the protective cover 225 is removed from the topsheet 220, the microcapsules 160 are sheared thereby releasing the lotion 165 onto the topsheet 220. Also, upon removal of the protective cover 225, most and preferably all of the adhesive 155 used to fix the microcapsules 160 to the topsheet upper surface 227 is removed with the cover 225 or alternatively easily

removed by a user's finger tips. In no embodiment herein is there to be a substantial amount of adhesive 155 left on the topsheet upper surface 227 once the protective cover 225 is removed.

5 It is again noted that the use of microcapsules is applicable also to the sanitary napkin embodiment herein for the transfer of lotion and other types of substances to the topsheet upper surface. It is also foreseen that while substances herein are meant to remain on and not go through the topsheet upper surface, substances which can penetrate through the topsheet upper surface may also be used. Any skilled artisan can readily see the possible advantages of releasing a substance (not lotion) at the  
10 topsheet upper surface for transport to additional layers beneath the topsheet upper surface to, for example, bond with other materials and/or activate other materials to produce some desirable effect.

While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other  
15 changes and modifications can be made without departing from the spirit and scope of the invention. It is therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

**WHAT IS CLAIMED IS:**

1. An absorbent article comprising a liquid impervious backsheet, a liquid pervious topsheet joined to said backsheet, said topsheet having a bottom surface positioned away from a wearer and an upper surface oriented toward the skin of the wearer when said absorbent article is being worn, an absorbent core positioned between said topsheet and said backsheet, characterized in that:  
  
a protective cover having a pair of opposed end edges and a pair of opposed longitudinal edges is releasably attached to said topsheet upper surface.
2. The absorbent article of Claim 1 wherein at least a portion of said topsheet upper surface comprises an amount of a lotion coating, said protective cover at least partially covering said portion of said topsheet upper surface comprising said amount of said lotion coating.
3. The absorbent article of Claim 1 wherein said protective cover is releasably attached to said topsheet upper surface by a releasable attachment means, said releasable attachment means being selected from the group consisting of adhesive attachment means, thermal attachment means, ultrasonic attachment means, mechanical attachment means, dynamic mechanical attachment means and combinations thereof.
4. The absorbent article of Claim 1 wherein said protective cover is selected from the group consisting of polypropylene films, polyethylene films, nonwoven webs, cellulosic release papers and combinations thereof.
5. The absorbent article of Claim 1 further comprising a plurality of microcapsules comprising lotion positioned between said topsheet upper surface and said protective cover, said microcapsules being embedded within an adhesive means for securing said microcapsules between said protective cover and said topsheet upper surface, said lotion being released from said microcapsules when a diaperer removes said protective cover whereby said microcapsules are disrupted and said lotion released onto said upper surface of said topsheet.

6. The absorbent article of Claim 1 further comprising elasticized leg cuffs positioned adjacent to said longitudinal edges of said periphery, said protective cover preferably being positioned inboard of said leg cuffs or said protective cover extending laterally outwardly beyond said leg cuffs.
7. The absorbent article of Claim 1 further comprising a release tab joined to at least one said end edge of said protective cover, said release tab being used for pulling said protective cover from said topsheet.

1/6

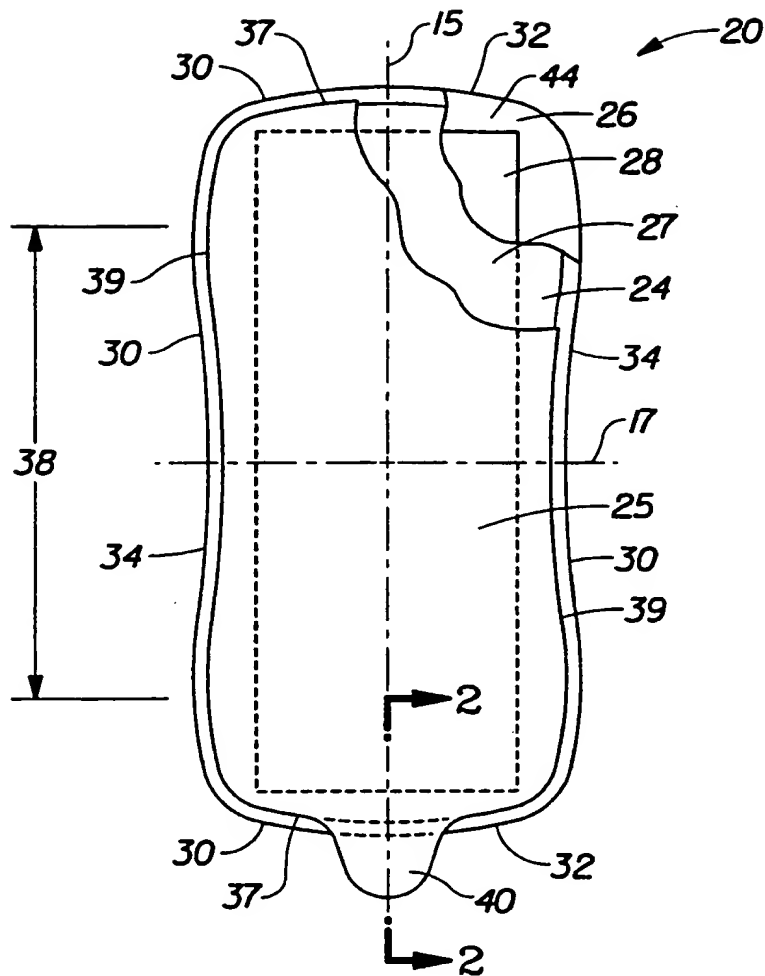


Fig. 1

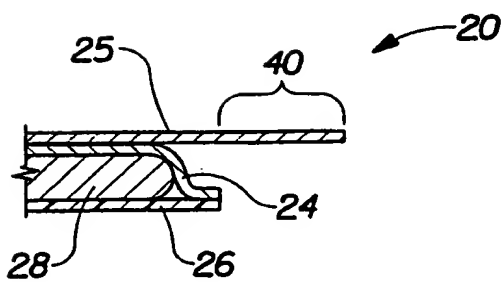


Fig. 2

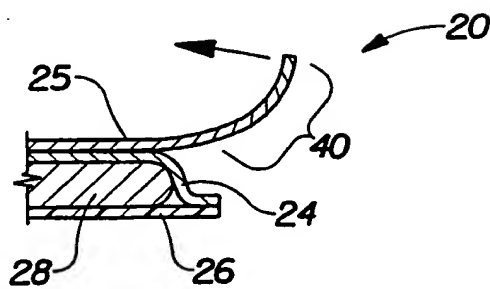


Fig. 2A

2/6

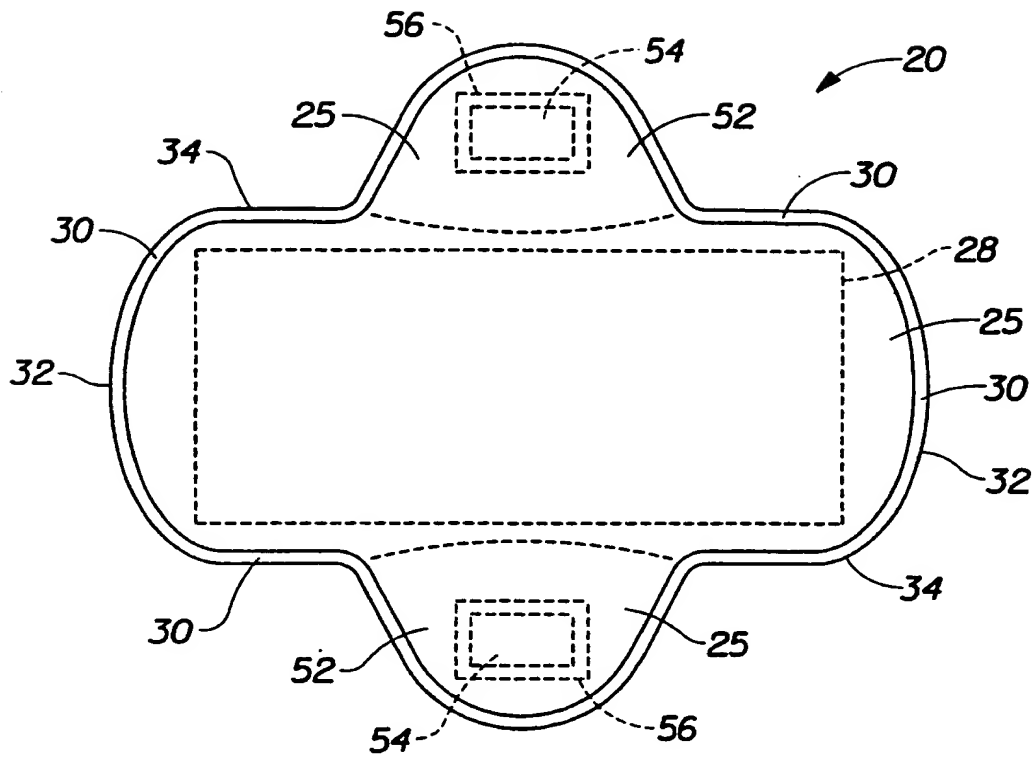


Fig. 3

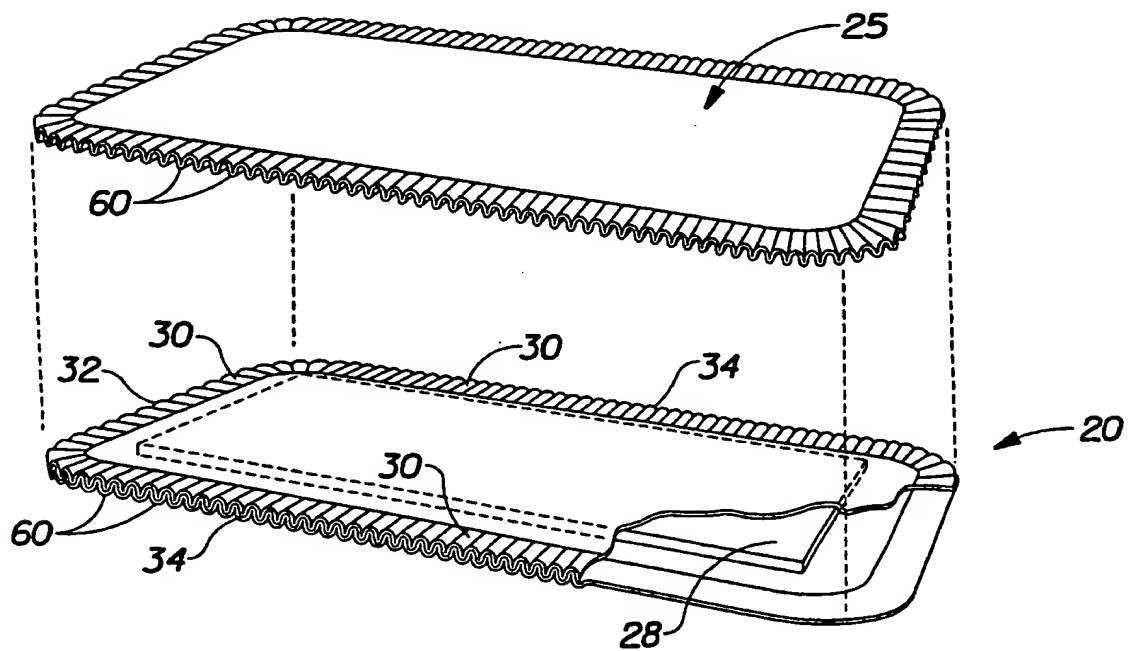


Fig. 4

3/6

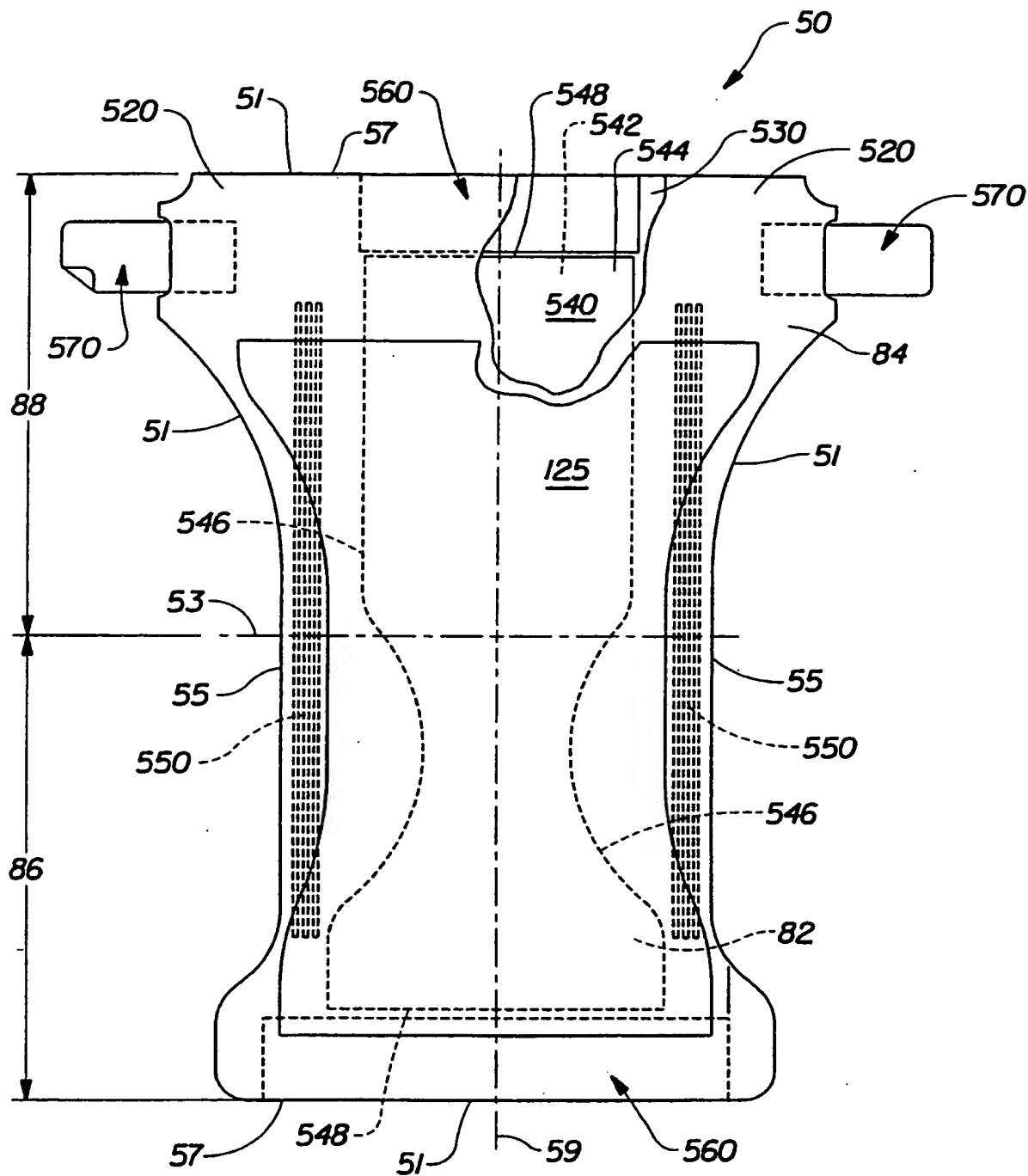


Fig. 5

4/6

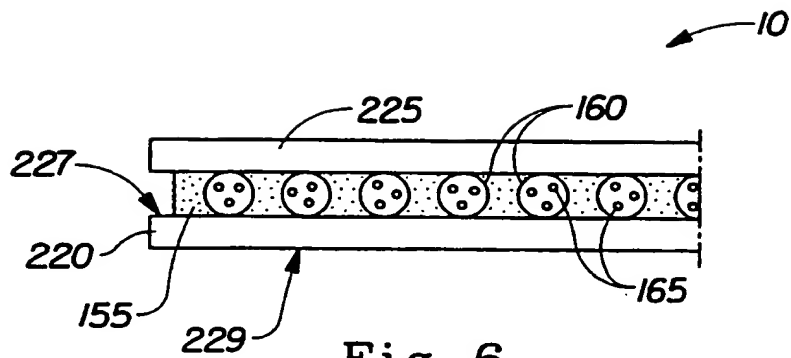


Fig. 6

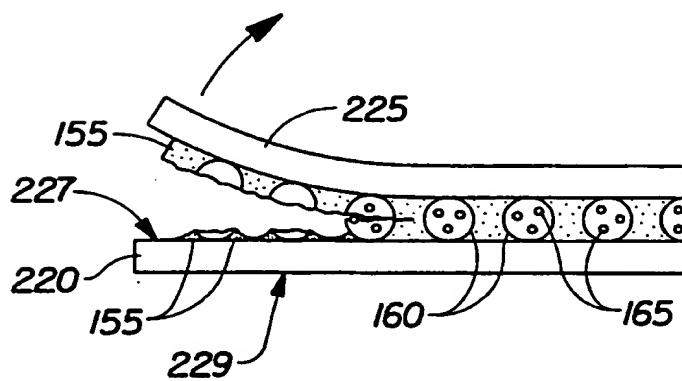


Fig. 6A



5/6

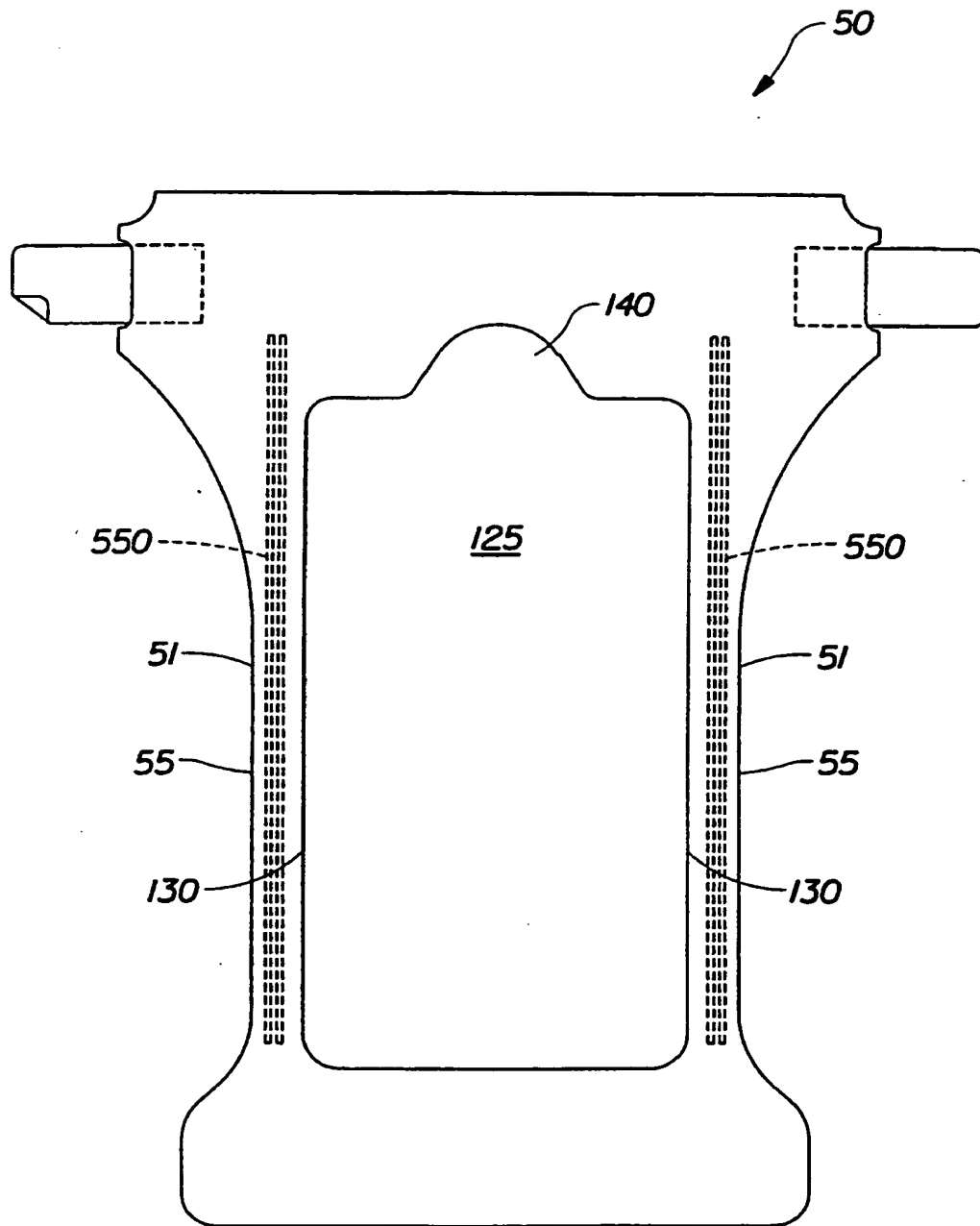


Fig. 7

6/6

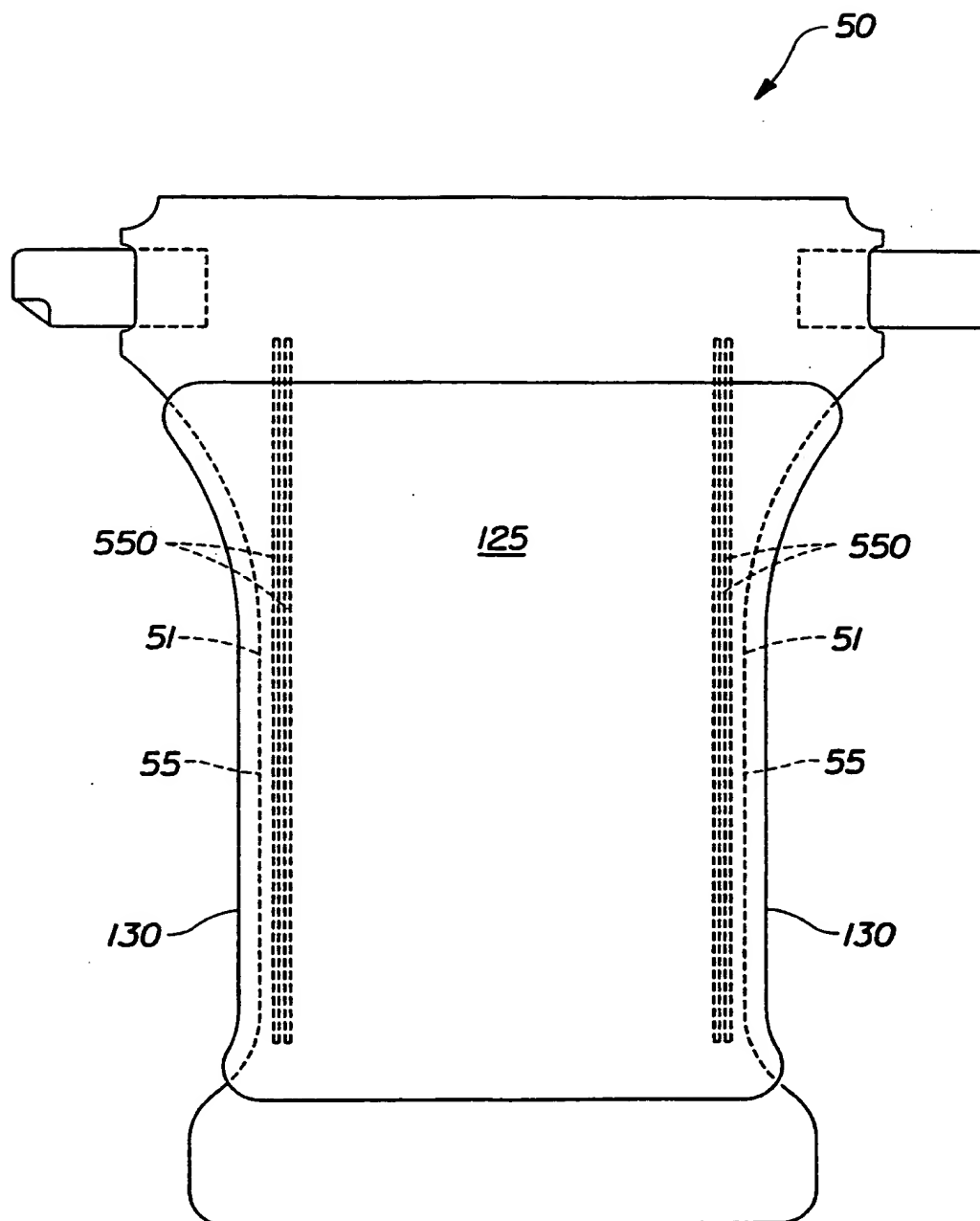


Fig. 8

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 98/00360

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A61F13/15

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	GB 2 311 727 A (HANSON SHAW BEVERLEY JANE) 8 October 1997 see the whole document	1-4,6,7
Y	---	5
Y	US 5 591 146 A (HASSE MARGARET H) 7 January 1997 see claim 1	5
X	FR 2 374 890 A (OREAL) 21 July 1978 see claims; figures	1,3,4
X	EP 0 347 319 A (KAYSERSBERG SA) 20 December 1989 see claims; figures	1,3,4
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### " Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

22 June 1998

Date of mailing of the international search report

02/07/1998

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Douskas, K

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 98/00360

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 284 767 A (KIMBERLY CLARK CO) 21 June 1995 see claims; figures ---	1,3,4
X,P	DE 196 06 902 A (WAGNER MARIA) 14 August 1997 see claims; figures -----	1,3,4

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IB 98/00360

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2311727 A	08-10-1997	NONE	
US 5591146 A	07-01-1997	AU 1748097 A WO 9725955 A	11-08-1997 24-07-1997
FR 2374890 A	21-07-1978	NONE	
EP 0347319 A	20-12-1989	FR 2632855 A	22-12-1989
GB 2284767 A	21-06-1995	AU 1402995 A CA 2122660 A FR 2713478 A WO 9516424 A ZA 9409971 A	03-07-1995 15-06-1995 16-06-1995 22-06-1995 23-08-1995
DE 19606902 A	14-08-1997	AU 1767597 A WO 9729724 A	02-09-1997 21-08-1997

**This Page Blank (uspto)**